
Space Weather Forecast

Issued on Friday, 24 February 2023 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Moderate solar activity likely throughout (Minor/Moderate R1/R2 radio blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with two low Moderate flares occurring over the last 24 hours. There are now five numbered sunspot regions on the visible disc, all with complex or very complex magnetic configurations, but varying in size. The largest region on the visible disc, and one of two regions with very complex magnetic configurations, is AR3234. Most regions displayed slight growth, including a new small, weak and simple region in the southeast quadrant which is yet to be number.

Currently no significant Earth-directed CMEs are forecast, although glancing impacts may occur on Saturday.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of an enhanced solar wind from a coronal hole, and was predominantly elevated, although briefly reached Strong levels during the evening. The strength of the magnetic field has been predominantly at Moderate levels. The north-south component was generally weakly negative, although was briefly moderately negative early in the day. Geomagnetic activity was Unsettled to Active.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate solar activity is likely to continue, with a slight chance of High activity. However, new or returning regions are likely to rotate onto the visible disc during the four day outlook period, potentially adding to the chance of significant flares.

Solar Wind / Geomagnetic Activity: There is a low confidence CME in the forecast, perhaps arriving on the 25th. Earth is currently experiencing an enhanced solar wind environment, but this is likely to have only minor impacts. However, two further solar wind enhancements from other coronal hole features are likely to influence Earth at times from tomorrow onwards. Therefore the solar wind is expected to be slightly elevated to elevated throughout, with a chance of reaching strong levels later day 4.

Geomagnetic activity is expected to be Quiet to Active with an increasing chance of G1/Minor Storms due to a combination of different HSS.

Energetic Particles / Solar Radiation: Solar radiation carries a slight chance of rising towards the S1 level, should any larger flares occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	10	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	70	70	60	60
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)